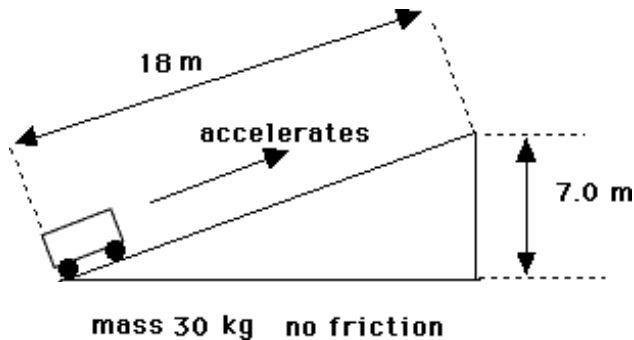


Example #8: The cart below has an initial speed of 2.0 m/s and accelerates to 5.0 m/s by the time it is at the top of the ramp. How much power is developed? Hint: to find time, use kinematics.



→ find time: $d = v_{av} t$

$$18 = \left[\frac{5+2}{2} \right] t$$

$$t = 5.14 \text{ s.}$$

→ work is done against gravity & inertia:

$$P = \frac{W}{t} = \frac{\Delta E_p + \Delta E_k}{t}$$

$$= \frac{mg\Delta h + \frac{1}{2}m[v_f^2 - v_i^2]}{t}$$

$$= \frac{30(9.8)(7) + \frac{1}{2}(30)[5^2 - 2^2]}{5.14}$$

$$P = 4.6 \times 10^2 \text{ W}$$